Mr. Alan Parrish's

Oral History

Kennedy Space Center

Held on Date June 14, 2001

Interviewers: Dr. Henry Dethloff,

Dr. Lee Snaples

Transcriptionist: Sharon Youngquist

Lee Snaples: It is June 14, 2001 and we are here with Mr. Alan Parrish and if you could start off by giving us your full name.

Alan Parrish: OK. Full name is Alan J. Parrish.

Snaples: All right. Where were you born and kind of some basic . . .

Parrish: I was born in a small town in south Georgia, Adel, Georgia. You want to go on with . . .

Snaples: Yeah. Just general background.

Parrish: I graduated from the local school system there, county school system. I went to Georgia Tech after high school graduation for a year. And then that was during the Korean War so I left Tech and enlisted in the Navy for four years during Korea.

Henry Dethloff: Where did you serve?

Parrish: Heavy cruiser, USS Macon. [CA-132.] It's razor blades now.

Dethloff: Pacific?

Parrish: No. I was in the Atlantic Fleet.

Dethloff: In the Atlantic?

Parrish: Yeah.

Snaples: Got a Georgia ship.

Parrish: We were going to the Pacific, but we did not. And then I came out of the Navy and went back to Tech. Graduated electrical engineer (EE) in 1960. Went to work for Western Electric Company as a guidance engineer on the Titan. We didn't know it was the Titan I at the time. It was the only Titan we had. And put in hardened sites out west for 2-2 ½ years.

Dethloff: Did you have much sense or expectation of what was happening in the world of missiles and rockets?

Parrish: Well, it was all military then. I mean those were ICBM's. We were right in the throes of the cold war.

Dethloff: And you knew what was going on.

Parrish: And I knew what was going on there and I mean when you see the hardened sites you know what could come down on you from the sky some times. So we did two squadrons in Denver and two squadrons out in Marysville, California and

Moses Lake, Washington and by the time we finished installing all of the Titans they were obsolete. The only one that was ever launched from a silo was accidentally and it blew up. Inside the silo at Chico, California so . . .

Dethloff: Did you work in New Mexico too?

Parrish: No. No, just Colorado and California were the two sites. After that the Niki-Ajax was supposed to come under contract then and that's where we were going at the end of the Titan. Well of course it never went under [contract]. Not Ajax. Ajax was the air to ground. This was anti- . . . the first anti-ballistic missile system we had, Niki-Zeus, was it?

Snaples: Zeus.

Parrish: Zeus. Yeah. And of course it never went into contract so I transferred into the telephone engineering group with Western Electric. Went to Atlanta. Not very happy with that. In fact, I was the 42nd diploma'd engineer that left Atlanta Telephone Engineering. The group from there came down here and formed the nucleus of the communications group here at KSC.

Dethloff: That was as a Contractor?

Parrish: Nope. We came with NASA. NASA was hiring then, this was in 1964.

Dethloff: OK. So you jumped ship?

Parrish: I jumped ship from Western Electric and came, which is just the opposite of . . .

Dethloff: All right. Did you know what you were getting into?

Parrish: Oh yeah, I mean I was excited then. I had gotten up on a ship even at 4:30 in the morning to see Sputnik come over in Boston Harbor. So I was very excited about the space business and then a chance to get in on the ground. One of my friends had come down earlier and then he was probably responsible for recruiting, I think we had an many as 20 or 21 ex-Western Electric people here. And communications, that was when the communications infrastructure was being built. All the wide-band terminals were being put it, regular data services, all the wiring and cabling.

Dethloff: That was in 1964?

Parrish: 1964, right.

Dethloff: And you're a television systems engineer?

Parrish: That's what I came down as, a television systems engineer.

Dethloff: There weren't too many of those around.

Parrish: No. I was probably the only one.

Dethloff: That's what I was wondering.

{laughter}

Parrish: We had a very small section. We had an operational inter-communications systems engineer, and a television systems engineer. There was a wide-band engineer so I think we had a section of maybe 6 or 8 people in a whole Branch. One of the sections took care of the telephone office. The telephone office was going to be NASA's telephone office. It was ordered by NASA procurement. And by the time it was delivered there was a political decision that said no, Bell South, well it wasn't Bell South then, it was Southern Bell, would own it and operate it. So the title was transferred to Southern Bell at the time as a regular franchise service.

Dethloff: What are the television systems that you're installing?

Parrish: Well, LC 39 was being built at that time. Now we had Complex 34 and 37 were already pretty much built.

Dethloff: OK. So this is a service operation system you're working on. This is not a public media?

Parrish: No, it's not a, well it became . . .

Dethloff: Or both?

Parrish: . . . No. Not at the time because Debus didn't care too much for the Press. I mean our television system had to be engineering oriented.

Dethloff: OK. Good.

Parrish: You wouldn't believe what we had to go through to get the first video, color video recorders here. He was not, well I wouldn't say he didn't think the Press had a right to know, but they didn't have the right to know real-time.

Dethloff: Yeah.

Parrish: And television is real-time. So we were installing the television system at Complex 39. Pretty much the same format and features that you have out there now. Of course it's been upgraded two or three times since that time. But it was the complex of television cameras at the Pad and all of the other areas. I think we had between two Pads somewhere around a hundred-and-fifty TV cameras in the first system.

Dethloff: Is that right?

Parrish: Yeah.

Snaples: What were initial impressions of when you got here? I mean what was it like to get in 1964?

Parrish: Well, it was a field operation then. But I had come, the Titan was a field operation too. So I was comfortable in you know boots and work clothes and riding around in four-wheel drive vehicles and all of that. And that's what it was then pretty much. Didn't have many NASA people. Well I used to remember what my badge number was, which was the number in hiring NASA, and Contractors, I think we had, outside of the vehicle contracts that they had already at Complex 34 and 37, I don't think we had more than ten different Contractors here then. Maybe less than that.

Dethloff: What were you working out of physically, what building?

Parrish: You know where they're cutting a new road down here on SR3?

Dethloff: OK.

Parrish: Right where they've cut it was an old house that was left here. You know that people used to live there. And we took that house as the Branch Chief's Office and put three trailers down there. That was our first office.

Dethloff: OK. I figured you'd be over on Air Force side.

Parrish: Well, we just missed that. Everybody else had been over behind the A&E Building in trailers and all over there. They were all NASA people though. You've gotta realize, you know even then it was here's NASA people, here's Air Force people. But we had taken over A&E and E&L too over there I think and there were trailers behind that. When I came down here to interview for the job, I interviewed over there. By the time I hired on . . .

Dethloff: Well that's interesting. OK.

Parrish: . . . we had moved over here. In fact I just noticed because that's the first time I've seen the new road, which had been talked (about) around here for fifteen years. It's finally getting done. Well they cut right through where the office was.

Dethloff: Now are you working with many Air Force people or any Air Force people in setting up?

Parrish: Back then well, I mean, let's see when I came down, the first launch I saw was the GT2, that was the man-rating flight for Gemini-Titan. So that's all Air Force. Air Force lost that. All we had was the, you know the payload on it. So GT2 didn't launch. It shut down on the Pad, which I thought was pretty exciting.

{laughter}

Parrish: Just kidding there. But it was all Air Force. In fact we were treated a lot like Air Force people. We could join the Officer's Club for instance at Patrick because we were considered . . . they considered us a part of their program and of course we considered them a part of ours.

Dethloff: But it worked.

Parrish: They owned the vehicle. It worked good. There was never any problem. It worked good.

Dethloff: That's important. OK.

Parrish: I don't know whether it could work today. I don't know, maybe we've gotten so bureaucratic and all now that we couldn't pull off something like that.

Dethloff: Well, I wondered because when you look at, even now, you look at the map and it's still kind of . . . it's amazing.

Parrish: Well, I'll tell you, when we put in Firing Room 4, which was a blue firing room, I mean that's secret, you know for Air Force payloads only out at 39 we didn't work as smoothly as we did back during Titan. I mean I could tell that difference already. But of course that was 25-30 years ago.

Dethloff: You had to work together. That was all there was.

Parrish: Right.

Dethloff: But that's an interesting thing in my mind, is the relation between Air Force and NASA and how that has changed, and sustained or whatever.

Parrish: Well, things eased up because you know the head of the Space Division when Challenger went was a fellow named McCartney and I was on the Readiness Review Team for Vandenburg. You know we spent 8 billion dollars out there trying to get a Shuttle off. And it's funny, I worked for McCartney then being on the Readiness Review Team, and then he came here. So we were able to make things work well with the Air Force because Air Force ends up as Center Directors.

{laughter}

Snaples: Yeah. We had a meeting with Bridges yesterday so.

Parrish: Have you interviewed McCartney?

Dethloff: On the 25th, 26th, somewhere in there, I think, is when that's going to happen.

Parrish: Good luck. He's a cutter.

Dethloff: But basically your first years, you're doing the Communications setup, you're a NASA man, and the Center construction is really in a high state.

Parrish: There's new construction. Right. We were supporting Gemini. I mean, but very little. We had a Gemini data review room in the O&C Building. And one of the first jobs, in fact, I had to work the first Thanksgiving I came down here, getting in two data terminals to bring data from Pad 20 over to the O&C Building. But like I say, we supported the Gemini Titan, but not from KSC Proper, from Blockhouse 20. And that was about the only thing we had over here was, what did we call it, the Gemini data center is what it was.

Dethloff: Now when 39 is being constructed there, for a while there's talk about three Pads.

Parrish: All of the construction drawings had three Pads, A, B, and C. Never went to C. Never even piled dirt up on 'em. First thing, when I came down here, 39, the sites had, oh God, thousands, maybe even million of tons, of sand piled on them trying to compact that dirt out there. So if you went out to where the Pads are now, it was just great large mounds of sand. Well they never even put sand on Pad C you know. It was pretty much A, B from the beginning. They did site all three.

Dethloff: When were you ready at 39?

Parrish: Oh gosh, date-wise?

Dethloff: I can always look at the launch record but I was just . . .

Parrish: Well, actually KSC was ready before the rest of the program was. In fact, we went ahead and forced the roll-out, what did we call it, 500 F or 501 F, where we had a dummy spacecraft on because the spacecraft wasn't ready. So KSC was ready before the spacecraft.

Dethloff: And that was pretty remarkable really I think.

Parrish: Yeah. KSC was ready before the first Shuttle was able to launch I mean. One thing you can say about KSC. Give them a job and give them a timeline to get to it and let them get enough resources to do it and it'll be done on time.

Dethloff: You get it put together.

Parrish: Absolutely. We're so time-oriented launch-wise that it carries over I think in all of the construction projects or any other project they have that if . . .

Dethloff: Did you have any contact with Debus at all, personally?

Parrish: Oh yeah. I used to dread it every . . .

Dethloff: Is that right? Why?

Parrish: . . . well because, well Debus was a consummate engineer. He loved new things. I mean he loved. I had a hassle with him on Nicad batteries. Nicad batteries had just come out and he had his own little personal tape recorder and he would call us to bring him batteries. We're bringing nothing but bad batteries. And that's before the industry learned that Nicads take a memory. You know if you don't discharge them completely, and then recharge them, they'll only begin to hold as much energy as you let them lose. So what Debus was doing, he'd use the recorder for three minutes and then put it back on charge you know. And then he'd use it for three minutes again and put it back on charge. Well, the Nicads would never work. Of course we didn't know that then. I think we helped the industry develop the data on Nicad memory. But I used to dread, because I was always afraid I would misunderstand what he said and would answer incorrectly. The "sabre scar" was intimidating. {laughter} I used to dread going

up there and invariably I had to do all the briefings. Back to him not liking or not wanting to spend any money for the media. Before the first Saturn V launch, the networks wanted to, well first they wanted us to buy a color camera, so they could have a feed in color of the launch in color. But Debus said no he wasn't gonna do it. Then they came up with a proposal to use what was called at the time a colorizer. A lot of televisions stations trying to get into the color business at the time cheaply, they had this thing that you could; it worked perfectly if you set it up for an advertisement or something in between. You adjusted it so that it gave you a different color based on the shades of gray you know in a black and white camera. And so you could make an add or a lead-in something that looked really good. Well they proposed using the colorizer themselves on it. And Debus was leery. I went to CBS in New York where the company put on a demonstration of the colorizer and I had to write a report for him. And he made a decision and in the report [I] said no it won't work. I mean when the Saturn V goes, you've got so many shades of gray it'll look like a kaleidoscope of colors and bear no resemblance to the real thing.

Dethloff: That was your report?

Parrish: That was my report and he agreed.

Dethloff: Which he wanted to do anyway.

Parrish: Which he wanted to do anyway, right. And so that ended that. But we did ultimately talk him into, and mainly from a historical perspective, talked him into buying two Ampex Color Tape Recorders. They were twenty-five-thousand dollars a piece and were as large as a freezer at the time and that was the first color. And we had one color camera for each Pad that he finally agreed. And we gave the Press a feed from that camera.

Dethloff: Now are you involved much with media relations?

Parrish: I was then because we built . . . the Communications Group is who built the Press Site.

Dethloff: Yeah. That's your business. Now are you personally becoming much aware of visitation, public pressures, rising public interest, I'd say? I'm asking about visitation, I guess, and the public awareness developing. It seems to me, about 1966 all of a sudden people look around and say, "Oh my gosh. We've got people here all over the place."

Parrish: Well it was a lot of pressure and that's what forced us into looking at bus tours.

Dethloff: Yeah. And Visitor's Centers and all of that good stuff.

Parrish: The bus tours we started I mean on a . . . it was like they called and said, "We've got two leased buses coming in here and you guys have got to put a sound system in." You know because at the time they had in the first buses a guy standing there with a script and a microphone. Well at that time there were no real 12-volt anything. You couldn't find tape recorders. Well I'm sorry. The first buses that went out had a taped program. We had to put tape recorders on the buses and they just turned the tape on and it ran and they tried to adjust the bus speeds to get to the right thing at the right time {laughter} and I mean it was a fiasco from the start. And I mean we had 110-volt tape drives running off of 12-volt inverters and all of the things that you really didn't want to do as an engineer. But he, I don't know who convinced him, Debus didn't come up with this thing on his own.

Dethloff: OK.

Parrish: No. And I don't know whether von Braun convinced him because he was much more aware of the public and the need for the public in support of the Space Program than Dr. Debus.

Dethloff: But all of a sudden in 1966, I've seen some documents…

Parrish: Oh yeah,

Dethloff: And KSC says “Oh”. And that seems to have set a lead or a precedent throughout the NASA system.

Parrish: It may very well have done. I was a little more internally focused in that at the time. But I know there was a lessening of restraint at that time. . .

Dethloff: OK, that’s a good way to put it.

Parrish: Because we’ve been trying to decide if the networks would own. . . how the networks would function at the Press Site. Would they own their buildings? Would they own their copper pairs? Would we let them use satellite dishes? That was a little later in the whole thing. Or would we provide everything? Would there be. . .

Dethloff: And that’s the way it went, wasn’t it?

Parrish: Yeah.

Dethloff: NASA provided. . .

Parrish: We provided the service but internally they do, they own those buildings out there.

Dethloff: OK

Parrish: And so I know that all kind of straightened up. And it must have been some political decision and some pressure from Webb or von Braun or somebody.

Dethloff: That's interesting.

Snaples: Did the engineers have a lot of respect for Debus because he did have that ability?

Parrish: Yeah. I don't think he would have ever found anyone that didn't know the history of the group and also did not respect him. You know in that regard. He was smart. I mean, really, you want to go up there and give a briefing to him, you better give your soul to the Lord because . . .

{laughter}

Parrish: . . . if you were wrong technically that was it. I mean it. He would know it. And everybody knew it. It put a lot of pressure on you to do that.

Dethloff: That's interesting.

Parrish: But he was very smart, in a lot of fields. I mean you couldn't fool him. You know, shouldn't even try.

Snaples: Do you think that was key when KSC started to have someone who had that knowledge? I mean would it have worked with somebody who was more of a manager than a. . .

Parrish: Well, I'd have to say no, I don't think it would have worked better with a manager. We're not real scientists here. We're real engineers here. And there's a world of difference and Debus was an engineer. He looked at a problem and he said, "There's got to be the best solution. Find it." And when it came he went and did it. And I think that's what we needed here. We needed to get built into us the discipline for checking things out right, making sure they're good, and being able to do it fairly inexpensively and do it on time. And I think that's the engineering discipline and the scientific method and all those things you learn he helped put in practice here.

Snaples: Did anybody ever ask him about the dueling scar?

Parrish: No, not that I ever knew.

{laughter}

Snaples: Did that story get around because it has come up several times . .

Parrish: I'll tell you about a friend of mine who was a rising engineer here at the time and of course we all worked for Karl Sendler, who just died you know, just a month

ago. And we worked for Karl Sendler and he was Austrian as was Debus. And this fellow, I won't name him, made the mistake one time, he spoke German also, the other fellow, although he was American by birth and all. And he made the mistake of telling some kind of off-color joke in German to Sendler with Debus standing there and the poor fellow never made it above Branch Chief for the rest of his career. {laughter}

Dethloff: Don't mess with the boss.

Parrish: Don't mess with the boss. In fact I saw him at Sendler's viewing the other day.

Dethloff: Was there any problem, incidentally, in relations between the Americans let's say and the Germans? Had that pretty well . . . that was gone . . .

Parrish: That was gone by then. We had, golly how many did we have? Albert Zeiler, and Gruene, and Sendler, and Debus, Knothe although Knothe was not a member of the Peenemüde group. How many did we have here? They all rose to very high offices.

Dethloff: That's right. Yeah.

Parrish: I don't know of any . . .

Dethloff: I was just wondering if any of that had lingered.

Parrish: No.

Dethloff: There seems to be no evidence of it.

Parrish: Nope. Don't think so.

Snaples: Could you give us your overall impressions of the Apollo mission?

Parrish: Well, I think the greatest thing that ever happened was Apollo 11, if you want to talk about engineering success. I'm not even sure many of us thought we could do what Apollo did. Take those men to the moon and better still bring them back. I don't think anybody doubted we could get 'em to the moon. I think the doubt was whether we could get'em back.

Dethloff: Get them home safely.

Parrish: Right. And so I think, of course you have to view it in glasses that we don't view through nowadays. We had no money problems, absolutely none. The whole Apollo Program I never heard one person say, "You don't have any money." And I think what do they look at it, twenty-five-billion dollars maybe for the whole Apollo Program and all of that. And that relieved everybody down here of a burden that is a

real burden on everybody down here now. So I think it has to be the best engineering achievement of mankind, but also we were lucky in some regards about having money to do it. We never had people. Now that was another thing Debus, and he was smart I mean you've got to give him credit. Debus foresaw that if he hired a lot of people he was going to have to lay-off a lot of people. So we never had many Civil Servants here. I mean Civil Service work, NASA people worked 12 on and 12 off for long, long periods of time. And we used to gripe and cuss at him we need more people, we need more people. But in 1969 and 1970 and 1971 when they were laying off all of the Contractors and everybody else around here and waving goodbye, we didn't lose any NASA people because we never had really staffed up for that. So that was another Debus decision that I think, looking back on it, was certainly a wise thing. So we had plenty of money. We had enough people and the people were dedicated. And the Program was an excellent program laid out and the machinery was good. The stuff worked. So I think it was a great . . .

Dethloff: How about Contractors? Were you working with any of the Contractors, Rockwell or . . .

Parrish: No. I worked with, well we went through a whole series, but RCA was the major communications contractor here. We had all of the operational intercom systems, all the voice data, all the television. Well, of course telephone systems. We had the crawler transporter comm systems. We had, for a while, some of the air to ground, you know, stuff. So most of the people we worked with Rockwell Spacecraft

Communications because we had to interface with the spacecraft on the Pad for testing. But mainly I worked at that time with people like RCA and then Federal Electric got the contract.

Dethloff: Bell, is Bell still someplace?

Parrish: We had Bell. We hired Bell Labs as a Contractor. That was after the Apollo fire on 204 because we had a communication problem there that exacerbated the problem a little bit on the fire. And so we ended up hiring Bell Labs as a consultant after that.

Dethloff: Did they fix it? I mean what . . .

Parrish: Well yes we fixed it. I mean it was a very simple problem and you gotta realize . . .

Dethloff: What was the problem?

Parrish: The problem was we had a two-wire ground communications systems here. The spacecraft had a four-wire. That says, four-wire allows two people to talk simultaneously. That says that if you're talking but someone wants to interrupt you, you can hear him speak. On a two-wire system sometimes that's not the case. So we had to rig, we had to develop, rig sounds bad. We had to develop a method of switching the

four-wire spacecraft system so that when we transmitted to the spacecraft it had to go on his receive pair and when he transmitted to the ground it had to go on his transmit pair and hook to ours. And so we built a duplexer that was voice operated. One thing we learned out of this is never use voice operated devices because it was screwed up, that is when he speaks it breaks a squelch and therefore his voice goes through. Because right before the fire, Grissom, unknown to anybody else, had loosened his helmet and the pressurized air coming out from under his suit in between the helmet caused enough noise in his microphones that it locked up that device I told you about. So that we could hear his breathing, we could hear him, "How are we going to get to the moon if we can't talk." You know you could hear all of that, but it was locked up, you know, the device was. And I mean we fumbled around there for a while and finally determined that's what it was and went and turned down the sensitivity on this device and everything clicked out and then about 15 minutes maybe after you had the fire. So anyway we hired and paid six million dollars to build a whole new comm system at Complex 34 and hired Bell Labs as a consultant during the whole process. We installed every bit of it and then they made the program decision to jump out of the 200-series and go right to Saturn V. So we never used it.

Dethloff: Used that Complex?

Parrish: No.

Snaples: Did you use the technology then on 39?

Parrish: Oh yeah, oh absolutely. There are no voice-operated devices anywhere at KSC right now unless they're in the telephone system, I can tell you that. And everything is four-wire now. Of course the world went four-wire too you know in your old telephone.

Dethloff: So that was, the net result though is a much more effective safe communications system following that?

Parrish: Right.

Dethloff: The Apollo is about to wind down, and what's the state of mind here now? There's like a hiatus setting in. Post-Apollo.

Parrish: Well there were a lot problems with the Contractor work force who had been here all those many years. And they were being told that well you go to Seattle or you don't have a job. Or you don't have a job in the first place. There wasn't much, I mean they were talking, we still had the first talkings of things like Apollo-Soyuz and of course Skylab . . .

Dethloff: Yeah. OK.

Parrish: And that was back on 34 and 37.

Dethloff: All right. Now is that bringing in for the first time an international presence that you hadn't had before? Do you remember any . . .

Parrish: That was the first. I don't know of any that we had up until that time of Apollo-Soyuz. Of course we had a lot of work here in construction contractors because we took one of the launch umbilical towers and modified it to launch a Saturn 1B. I don't know whether you remember that or not. We took, Saturn V is 384' and the 1B is 200 and some odd feet so we built a toad stool, a stool on the Saturn V to launch the Saturn 1B from 39. And that's how we did Skylab. But Soyuz was the first one. I mean it was nothing like Space Station. I mean the crews came here . . .

Dethloff: Follow that thought . . . we want to get into that later.

Parrish: Oh nothing that deep with Space Station. I mean we had so few Russian visitors here you know. Because Apollo-Soyuz was just linking up. I mean that was it. The work was done and away from here. You know that kind of work; the docking modules and all of that. We had very few, I mean there was an exchange of crews and stuff like that that came.

Dethloff: You didn't sense any real change in direction or activity levels or any . . .

Parrish: You used to hear big gripes about the Russian documentation. And of course they were metric and we were still English. I mean there were all of those kind of problems.

Dethloff: Technical. Did you run into some any real snags, interfacing?

Parrish: Well looking back from my perspective, no. I'm sure they must have because they were certainly apparent when we started Station. So I'm sure they must have. But it was out of my view. I didn't know anything about it.

Snaples: Was it hard to go from that "you've got plenty of money" to having to watch your budget as you shifted into Shuttle?

Parrish: Yeah, because NASA was always oriented toward projects. I mean you went out and you bought things for this project. You know it was Gemini-Titan or it was Mercury or then it was Apollo. And at the end of that time you cleaned house . . .

Snaples: Started all over again.

Parrish: That's right. Re-bought everything, the latest. Well, you couldn't re-buy anymore. That was the first big thing. You went in for budgets for test equipment and stuff like that and he said no, you know, use the oscilloscope. And we should have. I mean I'm not complaining. I mean I complained then, but we should have been much

more economical about the whole thing. So that was the first time I ever really, in the preparation of test equipment budgets and products for use and stuff like that, that I really ran into a time where we were cutting back.

Snaples: As you developed for Shuttle how much work did you have to do in converting facilities or the communications equipment to work with?

Parrish: Well the facilities alone were things like the VAB, did not take much. They had to cut a hole in the door to get the tail in. And unfortunately we didn't change the cranes or anything in there. We should have. And they have now. But the Pads of course were a lot of work. Had to do the flame trenches and all of that differently. The launch umbilical towers were torn down and turned into launch platforms. Communications system changed drastically. We went out to Rockwell, well it was Collins Radio at the time, went to Collins and built on a system that the Navy had. The Navy had an RF frequency multiplex system of about 24 channels that we went out and redid one for 112 channels, which had never had that many full duplex channels, that's a full four-wire channels in one RF cable. So we contracted with Collins for that and that was the system. In fact, it was used all the way through Apollo and up until just a few years ago here.

Dethloff: Were you around when the first Shuttle launched?

Parrish: Oh absolutely. Yeah. I had gotten out of. Well I had been pulled away from communications when it first started what was called LPS, Launch Processing System. And they had formed a group here, actually John Conway. You probably are going to interview John. He's coming here. A group to go out and get a new computer system for Shuttle. And then we were currently in the design of what was the CCMS, the Checkout Control and Monitor Subsystem. That's the firing room stuff. That's the thing, the stuff runs the checkout software. And they had, it was a political fight here. The launch vehicle people wanted to operate and maintain and have the Checkout Control and Monitor Subsystem or have the LPS actually, all of the Launch Processing System. And the other half, which were those people that were ground operations, said, "No that's a ground operations responsibility." Well we were getting dangerously close to having to make a decision when Debus did make a decision. And he gave the LPS to Karl Sendler. That was the ground part.

Dethloff: That's where you are.

Parrish: Well, we had gone through several reorganizations and I wasn't working for Karl Sendler at the time. But when they gave it to Karl and he had Pete Minderman form up a group of people. They gave him carte blanche to go anywhere in the Center and get the people that he needed to put together a team that would do the operations and maintenance of the LPS and would do the operation of it. And so I got jerked out of where I was, my very comfortable job over in Comm, and given the Branch, the CCMS Branch which we had . . .

Dethloff: When? In 1980?

Parrish: 1980 it was, right.

Snaples: That's what your biography online says.

Parrish: Is that what it says? So it's probably right. It was April of 1980 I guess when we formed. So then that group of people were given the task of getting the LPS running. And at the time we had no test equipment, we had no contractor, had no documentation, had no manuals, had no software written, had no nothing. That late. We were supposed to launch in 1981, remember? And so we, the LPS Division ended up with about 160 people, which was a large Division at the time. I had 40 people in my Branch at the time. And so we set to work to get ready for that launch and made it. I mean we were ready. We had turn-keyed the firing rooms. We had all the software CDS running, RPS running, CCMS running. Had a good contractor on-board when in the process we had a contract.

Dethloff: This is a dumb question I guess. But how did you know what needed to be done to make that conversion for the Shuttle? Where are you connecting with . . .

Parrish: with the Shuttle people. The launch vehicle people.

Dethloff: OK.

Parrish: Because the way you check out a vehicle is you pulse it and look and see what it says. You're checking measurements. That's all in the world you're checking.

Dethloff: Most of which are electrical.

Parrish: It's just like you go over your car; you check your oil. But the only thing we'd do, is we'd do it remotely. So that if you wanted to check a fuel level in some device out there, you've got to have a sensor in that device you know that tells you whether it's full or empty. And you've got a way of getting that data back to a computer. So you get what is called a measurements list from the vehicle people, the Shuttle people. They say, "If you go on this pair of wires right here you're actually going to read the bus voltage, bus A voltage." So you say, "Fine." Then we have to interface with that 2-pair with a device or sensor of some kind that when you address that device you see 24 volts and you know that's bus A and you then monitor it. And then what we have to do is put redlines on it because the engineer is going to tell you, "I don't want that bus voltage to ever go below 22 volts. If it does, I want a hold. I want to stop what we're doing." So then you put redlines on it. You say plus or minus 2 volts at 24 and then you build a system that monitors it. And not only monitors it, if it starts going down it warns the engineer at the console that his bus is dropping. And then if he tells you he wants a pre-set hold, then you do the software that if it goes below 22 volts you stop everything or safe it.

Dethloff: Just the task of assimilating this information and . . .

Parrish: It's a job. The documentation is . . .

Dethloff: Yeah. That's what I'm thinking.

Parrish: . . . a tough job. No. We had a very large documentation section that documents that from the design standpoint. And then you've got the configuration management of it is tough too. And it changes every mission. We started out I think the system was built we could not monitor more than 64,000 measurements. We were, believe it or not those computers that we used out there were 1964 vintage and had 64K of memory. That was it. I mean so that's 64,000 crammed, we used every bit of memory we had available in those computers.

Dethloff: It's amazing isn't it?

Parrish: It's amazing. And now I don't think they're checking more than, well don't put this down, but I would imagine it's 2,500 measurements. But on those first missions boy every engineer, everybody wanted to know, because we didn't man-rate the thing. We put men on it first you know. We didn't go through a man-rating series of flights where you can take a little chance. So that's how, no you're right. From the time you get a measurements list until you turn out software that runs on computers that does a decent job.

Dethloff: Just the meeting to get . . . I guess you had to meet three times a day to . .

Parrish: Oh yes. Or more.

Dethloff: . . . just to find out what's happening.

Parrish: Or more. Yeah.

Dethloff: . . . to keep on top of it.

Parrish: There for a long, long time leading up to the first launch we met with the design people. We finally put together a group of people that came out of DE, Design Engineering, and us, and we met every afternoon from 5:00 – 7:00.

Dethloff: I would think you'd almost have to.

Parrish: 5:00 – 7:00 every afternoon. And we took a look at trouble tickets, things that occurred during the day that required fixing. So we set the priorities on those things that needed to be fixed. We did that every afternoon from 5:00 – 7:00 everyday leading right up to the first launch.

Snaples: Did you have the sense of accomplishment with the launch of STS-1 that you did with say some of the early Apollo launches?

Parrish: Well I did because I was more, I mean personally I did because I was more intimately involved with them than I was in the first. But I think that would be fair to say everyone did. I mean we kept getting pepped by the fact that the Shuttle was not ready. But we were always driving to, where we always had a milestone driving to and everybody had a sense of accomplishment because it is a complicated task. If you look back at Apollo, it was a very simple machine. I mean we had an RCA 110 computer. I think it looked at 30 things. I mean that was it. And that didn't even come into play until just the last minutes so you went on what they call a launch sequencer, which we still call it out here. But I mean it was, you could have almost done that by hand. I mean really. And so it was a simple machine. Well the Shuttle is not a simple machine at all. So I think people that were involved back in Apollo that were also involved in Shuttle, like Ted Sasseen and you know some of the people who held on here through Shuttle, I mean they really appreciate the fact that Apollo was fairly simple and Shuttle is very complex. That's why it's so expensive.

Dethloff: Do you want to take a break? Are you tired?

Parrish: No. I'm fine.

Dethloff: We're pushing you pretty hard here.

Parrish: No. That's all right.

Dethloff: In 1986, I guess, well you're Chief of Launch Processing System.

Parrish: That was the whole ball of wax. I got the whole ball of wax then. There are three parts of launch processing. Record and Playback Subsystem is one part. And that's the one that does all the data retrieval so that the engineering people can go review data. And then you had the CDS, the Central Data Subsystem; it builds the software that runs in the firing room. And then you had the CCMS, which is the equipment in the firing room that actually checks out the Shuttle. So LPS is composed of all of those.

Dethloff: All of that. And any memorable, especially memorable moments in those Shuttle launches in the 1980's especially?

Snaples: Well, prior to Challenger?

Parrish: Oh, prior to Challenger. Well STS-1, I mean that's gotta be . . .

Dethloff: The highlight . . .

Parrish: Oh gosh yeah. That was an exciting time. Of course our concern during launch was that everything worked all right. And I mean we were lucky during all of those times we had mainly only one or two holds that were ever attributed to the Launch Processing System itself. The launch was it that we had a spectacular lightning?

Dethloff: We've heard about that.

Parrish: I've got some great pictures from that.

Dethloff: Yeah, pictures of that . . .

Parrish: I'm telling you. Now that was really . . . and I remember me and the Contractor Manager, the head Contractor, were standing out on the stairs at the LCC watching that. I mean it was spectacular. And of course it did, it hit the . . .

Dethloff: And Elaine knows that too.

Parrish: I couldn't remember which launch it was.

Dethloff: Do you remember which launch it was?

Elaine Liston: It was early.

Parrish: It was early, yeah. It was spectacular.

Liston: Apollo 12 was too.

Parrish: Oh, Apollo 12 was. Yeah. There was a Branch Chief fired for Apollo 12. {laughter}

Dethloff: And then. . .

Parrish: I don't, really I mean I don't think, I can't think of anything that stood out from that regard. Just a little personal aside, Fred Hayes was Grumman Vice President here. We had the contract with Grumman who actually ran the Launch Processing System for us. And one launch night Fred was there and he had never talked about Apollo 13 or anything else. And we were sitting in my office waiting, it was during launch countdown, and he started talking about Apollo 13. And he spoke from the time they came to KSC until they finally got back safely. He must have talked for an hour or two hours and I had a tape recorder in my desk and never thought to pull it out and just turn it on. And when he finished that he went ahead and talked about his plane crash. You know Fred was terribly burned over most all of his body and I'd never heard that story from him, either, about his plane crash. And I thought umm, but that was a spectacular event that had nothing to do with Shuttle.

Dethloff: Yeah. Yeah. I can see that.

Snaples: Challenger. What were your initial impressions and then looking back what are your impressions?

Parrish: We used to wait in my office because I wasn't in the firing room anymore then. I had an office in the LCC and wait until the "coolie cap" came off you know. And then we would walk out to the back of the LCC and watch it. And when it went, personally I said it's a "return to launch site." They're going to come back. I mean that's what it looked . . . because when the rockets, when the solids went off I looked and it looked like there was a contrail that the Shuttle was going to somehow make it and come around. I mean that was the hope. And then of course you stand there and you realize no, that's not going to happen. That was probably the worst day of my life.

Snaples: Had the success up to that point perhaps made, I know it probably had made the American public, but had it made the people at KSC maybe a little complacent, a little we can do this and there's not going to be any problems?

Parrish: I think more so out in the public, than here. Because I'll be frank with you, we were so bogged down with paper problems. I'm talking about trouble reports and things that were wrong that if Challenger hadn't happened I think we would of brought the Program to its knees anyway. I mean because of all the changes and the software changes that were going on. Where I was in LPS, we were launching, I mean the amount of work that we were doing was about an equivalent to a 13 or 14 Shuttle launch rate a year. Because of all of the re-work and re-doing we had to do on software loads. I mean we were actually running at about a 13 or 14 Shuttle launch rate and we were bogging down, giving out.

Snaples: Was that because of the number of Shuttle launches or because of improvements in technology coming so fast?

Parrish: It was the complexity of the job totally from both launch vehicle to the LPS side and the fact that, yeah I think, what did we hit. . . we hit about an 8 or 9 launch per 12 month period, right? And that's just about it. They'll tell you that now. It's just about max now. And they are much more efficient out there now than we were. So I mean we were up against the stops. Like I say, the paperwork would have brought us to our knees, I'm pretty sure, if it hadn't of been for an accident. But I don't think that in itself contributed to the accident. I think something close to what you are eluding to is what really was the problem. And it's what resulted in some people from Marshall you know saying bye-bye to the Agency was that in their own mind you could do it. There was no reason not to do it. And if you can do it, you can do it tomorrow and you don't have to wait until next month. And I think that was there. I never saw that here at KSC. Gene Thomas, a friend of mine, he was Launch Director at that time. And I mean if we had had redlines related to weather, or temperature, or any of that, we wouldn't have launched. I mean it's as simple as that. I came in that morning and on my TV in the office there were icicles hanging off the communications stations out on the Pad and I said, "I can't believe we're gonna launch in this weather." But my concern had nothing to do with the vehicle. It just had to do with, God we've got all of this ice all over the Pad and ice and tiles don't mix well. You know that was my idea, it's just too damn cold. But the problem is when they designed the Shuttle, nobody thought about freezing weather in Florida. It never freezes in Florida.

Snaples: Well now, and I want to talk, I want to ask you about this because you go on to be Head of Safety and Quality Assurance and Reliability. And I've been asked to prepare a 20 – 25 page monograph on the evolution of Safety and Safety Procedures here at NASA. And one of the things I have found and I'll see if you can confirm or tell me I'm on the wrong thing, is that for instance after Apollo 1 NASA had to expand its vision of Safety.

Parrish: The Safety Director of Apollo 1 was a Branch Chief. I was a Branch Chief. I mean Safety was not elevated any higher in the Organization than the Communication Branch. Right. You're right.

Snaples: Well and I mean what I get from the Official Report and from testimony that I've read through is that in Apollo 1 the assumption was always that if anything went wrong it would go wrong up there not down here.

Parrish: Ah, that may be. Yeah.

Snaples: And after Apollo 1 they had to kind of say, "Oop, we've got to expand." And then it seems that after Challenger, once again they had to expand their vision of Safety in terms of considering much more, many more factors than they had previously.

Parrish: Right. Right. In low-budget times maintenance is one thing that goes you know. And the other is what is perceived as a too large Quality and Safety Organization.

Snaples: OK.

Parrish: It happens every time. Like I saw it was a Branch Chief for Apollo 1 and for . . . after Challenger Gene Thomas, who had been the Launch Director, was made SR&QA Director then. And what was the . . . I don't know, I'm sure you have it, what were the Safety numbers prior to Challenger? But he was given authorization to hire 384 people in SR&QA. . . and they still had that many when I took it over, what four years later . . .

Snaples: Right.

Parrish: . . . or two years, or whatever it was, four years later. But you're right. That does happen. And it has happened again.

Snaples: And they have to . . .

Parrish: I mean it's happening right now, you know. If you want to look around where the offices were, where you looked at Reliability and looked at Quality and all of that. They've all been . . .

Dethloff: Reduced.

Parrish: . . . reduced. Put in different organizations and all. I try not to keep up with it. {laughter} But as someone who's been through it twice you're glad you don't have to go through it a third time, you know.

Snaples: In rebuilding after Challenger, what would you say were some of the problems you had to face and deal with and some of the real changes that took place here at KSC?

Parrish: Well the Agency over-reacted. . . that's the truth. I mean, what happened then for those years we stood down, everybody went through a major review. Over in the LPS we went through every measurement . . . I mean, it was a top to bottom review and every other organization was doing that. And Gene Thomas was doing that in Safety and at the time, it was very easy to err on the side of conservatism and they did. I mean they made, you know in Quality, mandatory inspection points that have to be inspected by a Contractor technician who has to sign off on it, then a Contractor Quality person has to sign off on it, and then a NASA Quality person has to sign off on it. Those are mandatory inspection points. So that if someone is supposed to torque this to 80 foot pounds, three people are going to be there and verify it. I mean the technician is going to do it and two other people are going to do it and they have to sign off and stamp and all of that stuff. And so the number of mandatory inspection points I mean just went astronomical. And that eats up your manpower. I mean that's one of

the reasons you need your manpower. And then non-mandatory but still inspection points increased by the thousands too. So it got very complicated. Slowed the process down some too. And of course all kinds of debates over whether you can ever inspect in Quality. That's one of things I did when we got back, when I got SR&QA is begin to look at a way at which you built quality into the work rather than into the inspection process. So what we, I did a lot of work in that. But I mean Gene had no choice. I mean you've got 384 people. I mean the number of people was decided before the amount of work was determined. So I mean, if you decide the number of people first, then the work by-golly is gonna take care of 384 people and that's what Gene faced. I've got this many people, therefore we're gonna put them to work.

Snaples: Was that a need-driven or perhaps a PR-driven move?

Parrish: Well, there was need there. I mean there was need; whether there was need for 384 people or not . . .

Snaples: Or was that just a good number to . . .

Parrish: That was a good number. I don't know where it came from. But I mean there was certainly a need for increased surveillance in that regard. Primarily because, I told you about these top to bottom reviews, primarily the Quality requirements and Safety requirements had never really been determined by a review of need. They had grown from no requirements to a set of requirements. And whether those were driven

by necessity or not, wasn't determined until Gene Thomas finished the review. I mean I don't think we had ever had a major Safety and Quality review on Shuttle like they had to do. And so they had to go through just like we did with a measurement list and they went through inspection lists and so of course they were very conservative in it. I also have a problem in that every systems engineer at Houston thinks his particular system is the most important one on the Shuttle and he wants everything done right. And so they also laid on KSC a whole rash of new Quality checkpoints too. And that came from the fact that they're, everybody is a little scared. I mean they. . . you know. . . it does happen.

Dethloff: Speaking of JSC and KSC and so forth, did you have a pretty good working relationship with . . .

Parrish: Quality-wise, yes. I'm pretty good on building personal relationships and that's what I did both with Marshall and with JSC. I spent a lot of time at JSC and at Marshall and when people know you and know what you stand for it's much easier to get along. And then of course we had part of the Challenger, the results from all of the Challenger standbys, is we had the SR&Q Directors from Houston and Marshall were in our firing room with me. I had a console; they had a console. So we could make an SR&QA decision whether it be Quality or Safety right there.

Dethloff: That was a post-Challenger . . .

Parrish: That was a post-Challenger, right. That was post-Challenger. And we did. Actually, I polled them and then I was polled by the Launch Director to go and so we could hold. In my career, I only held one launch. It takes a lot of guts. We had a problem that the engineering people just could not seem to explain. So I said, "Well it's not gonna go. Stop."

Dethloff: It's an anomaly or what . . .

Parrish: "We'll do it another day and you guys figure out what you want to do."

Part II

Dethloff: Now when did you first have contact or involvement with the Space Station?

Parrish: Oh let's see. We, at JSC's request, formed a Safety Advisory Group early in the process. It was started as a, raised by a concern from JSC who had been involved in the process earlier than we had. That the Soviet Union's concept of Safety and our concept of Safety did not always jive. And the worry with Station was if they don't have enough money to do things . . . well I mean, they don't have a lot of redundancies. They don't believe in a lot of redundancies you know. Well if something fails, well it's a bad day you know. And of course we do. And their documentation was lousy. We mentioned documentation back at Soyuz but it was terrible compared to ours

at the time. So we formed a group that I had two people that were members of that early it got involved with the Russians and Houston on Safety Policy and those kinds of things. There were several documents that came out of it. Most of our concern here had to do, because the decision had not been made at the time whether, what Russia wanted to do, any of those elements that they provided for Station, they wanted to handle them here. They wanted to be the handlers. They wanted to run the cranes. They wanted to do this. They wanted to do that and do that. Well, we don't do that.

Dethloff: Yeah. You handle the launch.

Parrish: Right. We don't do that. We take millions of people's products and we handle them here. And so that was one of the first arguments that came up. And our concern had to do with one . . . and OSHA got involved because Russia said they're not liable to OSHA's Standards for lifting objects and stuff. And that ultimately was resolved in the way that it should have been resolved. That is that we handle all the Russian hardware that was there. So we got started early. I don't recall ever any really major problems that we had with Safety that wasn't resolved amicably you know. I don't know of any. There was a lot of work because the interfaces and the way they handled things, gasses and toxic items and things like that, is different than us. But we pretty much had a mandate that said, "If it happens here, I'm the one who says how it's going to happen." And I mean that was it. And we stood 'em down on that.

Dethloff: Did you ever get to Russia?

Parrish: No, I did not. Gene Thomas did.

Snaples: Did you want to go?

Parrish: Not particularly. I guess as a traveler I would like to go.

Dethloff: I wonder if they've borrowed much of our knowledge of Safety, expertise, or . . .

Parrish: You mean to . . .

Dethloff: . . . they persisted in doing it their way or did they . . .

Parrish: I think as far as them manufacturing, I mean all of the work they did in Russia, I'm pretty sure they did it their way.

Dethloff: Their way. I'm just wondering if there was much . . .

Parrish: And actually I mean it's not, it's not a bad way. It's just not the way we do it. It's not ours.

Dethloff: Yeah. It works.

Parrish: It works. I mean we've spent a lot of money in cosmetics. They don't. You know if it's going to fly in space you can generally run a cable outside your spacecraft. Right? I mean nothing's . . .

Dethloff: Let her dangle.

Parrish: Yeah. So.

Snaples: What about some of the other countries we've had to work with, Italy, or Canada, or any of those?

Parrish: Most of them were no problem at all. I mean we didn't have language difficulties, I mean everybody speaks English there. The only country I remember that we had problems, and they may still have some, were the Japanese. I mean because of the well you know. . . we even had to go to class to learn how to conduct meetings when Japanese were there. You don't say this and you don't say that and you don't shake this. I mean we had to go through a cultural . . .

Dethloff: Training.

Parrish: . . . training, right, for that. From my perspective let's see I guess part of the time I was on the 4th Floor during that time. But from my perspective I don't know of any major problems that happened. You're always gonna have engineering and

engineering problems, but they love that. You know engineers like to stir up trouble. So they can fix it. But I don't know of any management problems they ever had.

Snaples: OK. You were here in the conversion from English to Metric?

Parrish: Has it happened? {laughter}

Snaples: Well, that's what I was gonna ask you? I mean was that a problem? Was that . . .

Parrish: Well it's a problem with people in my generation you know. It's not a problem, and I think the new generation as it comes along is not gonna have a problem with that at all. It's just like us. I mean you know I think right now 1.75 liters, what is that quart-wise, you know. But engineering had no problem. I mean of course, I don't know what the NASA policy is right now, but we went through for many years at which you had to put both English and Metric on it. What, have we changed to Metric totally now?

Dethloff: No, we really haven't.

Parrish: I mean I would not think so. I mean you know in four years . . . but I think the transition is going all right.

Snaples: Well we were talking to Terry Greenfield, and I don't think he would mind me saying, he described it as ludicrous.

{laughter}

Parrish: That would be Terry. And he was in the group that is right in the middle of all of that, the Design Engineering bunch. I did so many briefings on the 4th Floor that I learned all the dimensions in metrics because when you briefed someone from a foreign country you ended up having to brief them in metrics anyway. So that was my metric conversion.

Dethloff: In your relations with the Directors, could you comment about any particular Director, how you dealt with them? What they did do especially for KSC or anything outstanding that you. . .

Snaples: Or even maybe just different management styles?

Parrish: Oh. OK. Well we've already talked about the Apollo Directors. And I mean they were pretty dominantly the military or, I mean some still active military, or Germans. So I mean that . . .

Dethloff: Threw us in said style.

Parrish: Yeah. That style was, maybe you could characterize it as Prussian in nature and certainly results oriented. And we had a lot of that in the later group of managers. Dick Smith as a Center Director was a very good Center Director. But of course Dick got cross-wise after Challenger and it was unfortunate. And then I worked closely when McCartney and Crippen and they were different management styles, but both very easy to accommodate. With Crippen I always knew what the answer was going to be before I ever asked it. I mean he was that easy to read. McCartney was a little different and sometimes wore his three stars you know up there. But Bob, and both, I would say they were excellent Center Directors. Jay Honeycutt who was the last Center Director I was under, he was kind of lackadaisical and laid back a little bit. And came from the JSC school. Director-wise, well Rocco Patrone, you got Rocco Patrone during Apollo. Now that was one hell of a man. I mean he was a manager first class. Come down to modern times, Pete Minderman was a very good manager. He came from the Instrumentation and Telemetry side of the house. Raised by Karl Sendler just about and then he took over Design Engineering. And he had a very good management style. He listened closely and had no problem making a decision and generally they were good decisions. I wish I had known more of the Launch Vehicle side of the house people. The Ted Sasseens. Of course I knew Ted when he finally got out of the Launch Vehicle side. But I didn't know personally too many of them. Bill Rock was several things and lots of times you either liked him or you didn't like him. But I'll credit Bill Rock with one thing. Sendler was the only man here to stand up to Debus. I mean he would stand up to Debus. And he had built the CIF over here as Sendler's kingdom and that almost got us in trouble. I told you about the not making decisions on

who would do Launch Processing for Shuttle. And he had built himself a kingdom over there and when he retired they put Bill Rock over there. And Bill Rock set out to make the CIF a part of Kennedy Space Center and he did. And a lot of people don't know how important that was to the Kennedy Space Center, and in particular to the Launch Processing System. But I would credit Bill with doing that. George English was a good manager. You know he ran an executive staff for years and he was a people person. He kind of managed by personality.

Dethloff: When you were on the 4th Floor in 1994, the last three years up there. You were really in charge of Facilities, are you? That's the way I read that . . .

Parrish: Well I really . . .

Dethloff: You're kind of the ombudsman for everything.

Parrish: The way Gene and I, Gene is the Deputy, Gene just about took care of everything external to KSC.

Dethloff: OK.

Parrish: He was on the Headquarters Committees. He was on the other Center's Committees. He did this that and the other. I kind of took care of KSC.

Dethloff: That's what it sounded to me like you're managing managers.

Parrish: When Crippen got me up there he changed George English's job. George English was the staff director of the staff up there. Crippen really made me the Associate Center Director.

Dethloff: That's what, that's the way I kind of read that thing.

Parrish: That's what I functioned as. And that wasn't what the job title said but I pretty much . . .

Dethloff: But you're more facilities than personnel, is that right or not? Am I . . .

Parrish: Well, we didn't, see they got Jim Jennings up there now that has an administrative function. But the personnel actions, I mean things like we ran a promotion board up there. Gene Thomas was the Director of the promotion board, but I was on it. I mean . . .

Dethloff: So you're all intermeshed.

Parrish: Gene did, he did those kind of personnel things jointly, we did them jointly. The rest of it I generally had to do with the facilities and all the people problems. I

interfaced with the Fish and Wildlife. I interfaced with the IG's Office here. When Crippen called me up there we had 7 Directors under IG investigation. Believe that?

Snaples: Ouch.

Parrish: 7 Directors under IG investigation. And he called me up there and he said, . . .

Dethloff: Can I ask what was going on?

Parrish: Well we had one that was, had gotten himself into a job where he had to go to Washington quite often on a you know set of meeting schedules and all that. He developed him a girlfriend up there although he had a wife here. And all of that is not illegal of course you know. But then he started staying at his girlfriend's home but forging receipts for motel rooms. Now this . . .

Dethloff: Which is illegal.

Parrish: Which is illegal. Right. That's one. We had a case of a Director that was on the Credit Union Board and they decided that the Credit Union could use his supply card and just draw supplies for the Credit Union and the Government would pay for them. It saves the Credit Union money, right? Illegal. We had a Director who ran the NASA Exchange who didn't think it was unwise to have the buyer for the NASA

Exchange buy him household goods at reduced costs, which is not illegal, but it's certainly unethical. So we had you know . . .

Dethloff: What you can fall into, huh?

Parrish: Yeah. And Crippen said, "I want it straightened up." We also had Fish and Wildlife who wouldn't talk to anybody here. They were pissed off at everybody. The IG was gonna end up indicting everybody at the Center if he could, he was so upset because certain people withheld information. Certain people looked at them as if they were a nuisance.

Snaples: Sure.

Dethloff: Yeah.

Parrish: So Crippen said, "Straighten it up." So I did.

Dethloff: That's quite a task. You were in a can of worms there weren't you?

Parrish: Yes it was. But I mean he gave me, he said . . .

Dethloff: Carte blanche.

Parrish: "Whatever you need to do, do it." So yeah. I took care of a lot of personnel things not related to administrative personnel. But with that we got relations with Fish and Wildlife and the IG. All the IG people came to my retirement. They'd never been to a KSC retirement in the . . . {laughter}

Dethloff: That's a pretty good accomplishment.

Parrish: And we straightened up the senior executive core.

Dethloff: Straightened up the what?

Parrish: The senior executive core, the Directors, the SES people here. Had to let two go. They resigned so . . .

Dethloff: Kind of tough.

Parrish: Tough. But Crippen was straight arrow. I mean Crippen, you knew where Crippen came from. I mean Crippen drank a beer you know with everybody. He'd come down and this and that. But I remember, the management club had come to me. They had taken over cleaning up part of the beach down here as part of their service and they didn't have much money. And you could get the sign put up and you could get it put up for nothing with your name on it. You know, "Kennedy Management Association cleans up this part of the beach," if you let Budweiser or the beer distributor

put his (name) down. You know sign furnished by so and so. I knew what Crippen would say, you know, when I went in to see him. He would say no. I mean he just, he, the beer in his stomach was all right but to have beer associated with KSC was not.

Dethloff: Yeah. He kept his line.

Parrish: He kept his line there.

Dethloff: What about kind of an overview of . . .

Snaples: Yeah. If you were going to look back from today to 1964 and other than the technology changes, I mean what would you look at as the biggest changes here?

Parrish: Here at KSC and not the Agency?

Snaples: Well, or I'm willing to . . .

Dethloff: Wherever you want to touch, I guess.

Snaples: Yeah. Whatever you want to . . .

Parrish: Well, I look at my career, we're much more bureaucratic now.

Snaples: Is that good or bad?

Parrish: Well I think we've gone to where it's bad. I look back when Jim Webb was the Administrator. He may have been the only political appointee in NASA at the time. I mean Debus and von Braun and all they were called Exceptional Service people, but they were not political appointees. And somebody told me we got, surely we don't have 60 some odd, I mean 30 some odd political appointees at Headquarters now? They told me that there's five in the Public Affairs. I mean I don't know.

Dethloff: I don't know.

Parrish: I mean you talk to people and they just throw these out. But I mean it is indicative of the fact that we've become politicized in a fashion. I don't really have a lot of personal like for Goldin. I mean personally. I mean that's not gonna make it in the history books, that's for sure. But I mean the "cheaper, better, faster" was a fiasco from the start.

Dethloff: Yeah.

Parrish: The biggest, nicest, day of my life was when he had to admit that [that philosophy was a mistake]. But I'd say and I think as younger, when I came here in 1964 I mean the Center Director was only 15 – 20 years older than me. I mean we were a young bunch of people. And yet were given a hell of a lot of responsibility. I don't see that now. We tried. I mean Crippen he agreed with me on that. And we tried

to look at ways in which you could make a person feel like they were responsible and not just a part of the process you know. But I mean it's tough now, it's ingrained. . .

Snaples: Is that a result of size or of longevity and the Agency has simply been here longer?

Parrish: It may be. Someone has said you know every Government Agency at the end of their 25th anniversary ought to be abolished. And it might be some of that. But somehow, somehow we look like we have gotten to where we have to cover our tracks. You know somebody, if something happens . . .

Dethloff: The buck doesn't stop here.

Parrish: Yeah. If it happens and it's wrong a good engineering explanation of why it went wrong won't suffice nowadays.

Dethloff: Yeah.

Parrish: And it would back with Debus. If you had a problem and you told him and it was an engineering consideration that's why you had a problem. That's no problem at all. That's part of your job. And I don't, I think we got too worried about covering up in case of a problem. And so we, that has a tendency to spread responsibility rather than it does to accumulate it in individuals. And I know I had, looking back on it at my age

when I came here, I had more responsibility than I probably had when I was on the 4th Floor I mean when you really look at it. To spend money and to spend it wisely and to get something working . . .

Dethloff: And if it did, it was you and if it didn't, it was you.

Parrish: It was you, that's right. It was very, very clear. And you'd be called to the 4th Floor. That was, I mean not many individual engineers get called to the 4th Floor on the carpet anymore you know. It doesn't happen. But Debus would. He'd have your butt up there, just tell me what was wrong.

Snaples: So if you were coming out today would you want to come here?

Parrish: Well,

Snaples: I'm mean I'm gonna make . . . you got out of Georgia Tech. Or you've been working for . . .

Parrish: Would I want to come here knowing what I know?

Snaples: Yeah.

Parrish: Ah, no.

Snaples: OK.

Parrish: I left because, not because KSC is now a bad place to work. It is not. It is one of the best places in the world to work. It's just that I didn't want to work here the way it is now. But every young person that came up to my office when it looked like we were gonna lay off people. That was another bad thing. We had all the young people scared to death around here you know. And they'd come up and want to do this and do that. And I'd say, "Hey, this is a good job now. It's gonna be exciting now." You say it's not gonna be as exciting as Apollo was or Shuttle and all, but who knows. You don't know what you're gonna do here in your next career. And my advice to them was yes, stay. And I tried to hire every co-op student we had here. And my advice to every co-op is to come here. I mean this is an exciting place to work. I'd just gotten to the point where it was, I just didn't want to have to reinvent the wheel you know the 5th or 6th time.

Dethloff: Is the excitement still there in space, NASA?

Parrish: For me?

Dethloff: Not you. You just . . .

Parrish: Oh I think so. Look at, I mean look at what we're charging these people out here to come see . . .

{laughter}

Parrish: I mean that in itself. I mean you get it right down to money. I can't believe we're doing all that. Because it started out to be free. They raised the prices in all of Brevard County. Almost had a revolution here. So no, it's there. Well I get called all the time from people who know my association with the Space Center through relatives of mine or friends and they want to come.

Dethloff: They want to come.

Parrish: All the time. Yeah. Kids, young kids.

Dethloff: I've got all my grand kids are all coming over in a couple of weeks.

Parrish: They are?

Dethloff: Yeah.

Parrish: No. I think it's still a very exciting and very good job.

Dethloff: What's going to be the future here at KSC. I mean you left right before, are things changing, where are we going?

Parrish: Well, I don't know. Roy Bridges to me, Bridges has, he's certainly reoriented the Center.

Dethloff: In what way?

Parrish: Well he. I mentioned before we always viewed ourselves as an engineering center. You give us a task. We didn't design it. Well we did facilities. We were very good at facilities. But I mean we didn't design engines and things. You gave us a set of parameters and we'd get it in the air. And the other Centers always pride themselves, they're scientific centers. They don't get dirty there. Yeah. And all of that. And so I think Roy has seen that there is nothing guaranteeing KSC it's going to be a launch center of anything anymore. And for all of my career here that was guaranteed.

Dethloff: Yeah.

Parrish: and I think he's seen that we need to do these scientific liaisons with universities. We need to do more things that are not directly tied to a launch date because . . .

Dethloff: OK. Because I was wondering about that because the history of KSC is it is a launch center.

Parrish: Debus would kill you if you ever wanted to talk anything about doing research.

Dethloff: OK. But now that . . .

Parrish: Not our business.

Dethloff: All right. That's good. But only in the last few years are we beginning to look into it.

Parrish: Right. And we ought to. We developed a very good capability here of helping, of taking things that NASA had discovered like we do here. Like we do our sensor work and transducer work here is excellent. There's nobody in the world that does better sensor and transducer work than our design people here. And KSC has done the best job ever of taking things that we've developed here and spinning it out so a company can be formed. I helped form the NASA Incubation Center over here in Titusville, which it's whole sole purpose is to take entrepreneurs who want to get started and we'll help 'em you know at KSC. There are several that have spun off from technologies that were developed here. I see that we're trying to take over that task for the Agency. And I think that's a very good task for us. All these scientists, all they want to do is publish a paper. You know. I mean I hate to say that. None of 'em are very interested in taking what they've found and turning it into a product.

Dethloff: So that's technology transfer. . .

Parrish: Yeah. That's technology transfer. And that's what I think you can do. We started it and I think he's doing a good job of that. The technology transfer. And I think that's something we can grow and it would lessen our dependency on launch. I don't think we're ever going to turn into a design center here. Most of the people who come to KSC are at KSC because they don't want to do that. I don't want to go to Bell Labs and become a 35-year veteran of capacitors. I just don't want to do it you know. I want to come here. And so that's why they come here. Not to sit down and design some esoteric something or other.

Dethloff: So there's still a lot more hands on engineering here than even at most of the Centers?

Parrish: Even the technology transfer is a . . .

Dethloff: is a hands on engineering . . .

Parrish: . . . hands on engineering task. Right.

Dethloff: Good. OK.

Parrish: and I think he's done a good job of doing that. I don't, I missed the last couple of business leaders breakfasts out here, which is a good place for us to find out generally what's happening. But I think he's doing a good job in looking at those things. You don't want to take it too far. Because everybody always says, "Well KSC won't be the launch center for you know for the next 100 years." But one never knows. I mean after all we've got a good location here you know so. . . and I see Boeing's not doing so well with their new vehicle so . . .

Dethloff: Yeah. 34 or whatever. . .

Parrish: . . . so one never knows. Just keep the Shuttle running for another twenty years.

Dethloff: Yeah. And then something else will come along. What about the relations between the Air Force now and KSC here?

Parrish: Well, we don't have a heck of a lot. . . well let's talk facilities. We went four years ago and now we have a joint contract between the Cape and us on security services and all of that. The Air Force, that's not a new idea. We've tried that several times. The Air Force never was. . . well, part of the problem is that you never see the same Air Force guy twice. I mean the Commanders come in down here and Patrick is a jump to the first star. So what people would come in as Commander of Patrick, they're Colonel's and boom, three months later they've got their star and they're off

somewhere. So it was not very easy until they got a strong civilian presence down there with, what's his name? Ed Gormel, he's got Spaceport Florida now. Could you get enough interest in doing it? And also the budget crunch helps a little bit too. So now we've got a joint set of contracts between us for security and fire.

Dethloff: So you're getting more integration?

Parrish: More integration, but it's not driven by program needs it's driven by money and it's generally in the facilities area you know, just in the infrastructure area. So that works. Now Bush you know hinted at a look on NASA taking military payloads again on the Shuttle and I think the Air Force is interested in that.

Dethloff: What do you think?

Parrish: I think that was the worst mistake . . .

Dethloff: Taking them off in the first place?

Parrish: . . . decision we ever made. Taking them off in the first place and any other civilian spacecraft that we could fly. Because you think of the number of Shuttles we flew without a full payload bay. And then you have to bear the cost of . . .

Dethloff: Big costs. That's right.

Parrish: These are tremendous costs. It's not our fault. We'd load that booger up each time. So there's some talk you know about first non-classified payloads for the military because there is some costs involved now that we've torn up the classified firing room. We don't have it anymore. And you'd have to go back and go with a classified firing room again, but that's small costs really.

Snaples: Why can't you just turn the cameras off?

Parrish: {laughter} Yeah. Right. It's not that . . .

Snaples: It's not simple?

Parrish: No. Because you gotta bring everybody back up to Secret Clearance because anybody that sees the spacecraft, anybody that looks at the software. Software tells you where you're gonna put the thing in orbit.

Snaples: OK.

Parrish: And you've also got things like mass, weight, center of gravities, all those things, somebody finds out and they know immediately. Of course they know anyway. You know ninety minutes after it's launched other countries know exactly what it is.

Snaples: And it's out on the Internet.

{laughter}

Parrish: So I don't know. I think that and for this time the Air Force I think is in favor of it. They were so opposed to . . .

Dethloff: Yeah. That's what I've always heard.

Parrish: . . . to use Shuttle that was pathetic. I mean it was a fight all the way, not among the young Air Force Officers. They saw it as a great career opportunity, but among the people because they're so used to running things themselves they just didn't like to put a payload on somebody else's vehicle and it was a mess you know trying to get that done. They were so. . . well I started to say they were so happy when Challenger occurred. That's not true. They were so happy that . . .

Snaples: they could get . . .

Parrish: to the point of making the decision that says we're not going to do that.

Dethloff: Well, I feel like NASA and space are at some sort of a turning point or something and its hard to figure out what where.

Parrish: I'm surprised that in all this talk about the space force and all, there hasn't been any talk of either NASA, or a part of NASA, being involved in that, but I haven't

seen anything that said. That was a big rumor. I mean something we fought a lot about was having NASA go in the Department of Transportation or be absorbed by the Air Force. Always, about every three years somebody comes up with the idea and you do a study and . . .

Dethloff: Rumor hangs on

Parrish: . . . nothing happens.

Dethloff: What do you think, go to Mars or back to the Moon.

Parrish: I don't know. We'd better hurry up and get started although they're still keeping a lot of things alive. But, honestly, there are no vehicles coming down the road.

Dethloff: And the Shuttle. Is it going to keep running another 20 years and that's it?

Parrish: I don't know. I talked to somebody the other day about our oldest one. A tech, and he says, "Man, you wouldn't believe the shape that it's in. It's in great shape." We've got a good maintenance program here on vibration testing, and we've got ways of determining corrosion under paint now so you don't have to wait until something bubbles when you find out.

Dethloff: So you can keep it flying.

Parrish: We've got a good bunch of people here to keep it flying.

Snaples: Look at how long they kept the B-52s going, man. Those suckers are still up there.

{laughter}

Parrish: I know. You're right.

Dethloff: You're right. I hadn't thought about those.

Parrish: They're still there. Oh yeah.

Snaples: Those suckers are 40 something years old already.

Parrish: I always worried about vibration. Of course I'm not a mechanical engineer and so it worries me that that occurs. But everybody tells me no, the structures are holding up great. It just costs a lot of money. That's the only bad thing about Shuttle. You know we got sold a bill of goods on that one. God, I remember all the hype.

Snaples: It was supposed to be nice, cheap, and you'd turn around and. . .

Parrish: Cheap. 40 launches a year and no problem. Take the engines out every 100 flights. You believe that's what the original thing says. We take the engines out

every flight now. And have I mean for a . . . No sir, it's a hundred engine flight, I mean a hundred flight engine you know. Oh well. They have to do a lot of PR to sell a program I guess.

Snaples: It's about all I have. Anything we forgot to ask you that you wanted to . . .

Parrish: No. I just want to say that KSC is a good place to work, I'll say for certainly 35 years it was the best place in the world to work.

Dethloff: I bet it was exciting.

Parrish: It can still be that for young people today.

Dethloff: That's a good feeling.

Parrish: I hope we don't give up on NASA. And maybe, I don't know, maybe we'll never, well you can't go home, you can't return to what is was in Apollo and probably it's not a good idea. Like I say we've got, we had more money than we knew what to do with. And that's not a good idea.

Dethloff: Dangerous.

Parrish: Right.

Snaples: Well I hate to tell you, at Langley the hint I found for getting work out of a NASA scientist or engineers was to let them discover a problem they wanted to fix and then give them very little budget to do it.

{laughter}

Snaples: It seemed inevitable that they did their best work when somebody said OK, well I can squeeze twenty-thousand for you. And they'd go wow, now I can . . .

Parrish: You know what. We've pushed so hard and Goldin did that we've made some victims. I think about the one of the Mars Landers. The poor girl, I mean she wasn't but 23 years old and she was the project manager. I look at all of those project managers when they were doing all of that and not a single one had gray hair. And this girl is 23 and she was to develop the microphones for the Lander, you know the thing that was going to spit out. And she had no money. She bought the mic's from Radio Shack. Her testing, the only environmental testing she was able to do, was she pulled a vacuum on it in a Bell Jar. I think she had to go to a local high school, maybe a college there, and it worked under vacuum. And she wasn't able to do any vibration . . . anyway that's what she built. I mean she did what they told her to. And of course it didn't work. It didn't work. And so then . . .

Dethloff: You've got to have the resources.

Parrish: And so then, and then you know some of the first stuff I had heard they said bad engineering work was a part of the problem. That's not her fault. Believe me if you want a microphone to work when it's gone through space you've gotta spend some money on it. {laughter} That's right. I felt sorry for the little girl. Oh well.

Dethloff: Well, so we really appreciate this and your time.

Parrish: Oh, I appreciate the opportunity.

Dethloff: That was a great interview.

Parrish: I've had a good time. Well thank you very much.